DUGWAY PERMIT

MODULE VII

ATTACHMENT 4

HWMU 33
POST-CLOSURE PLAN

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	below ground surface
CFR	Code of Federal Regulations
DAF	Dilution Attenuation Factor
DPG	Dugway Proving Ground
DSHW	Division of Solid and Hazardous Waste
ft	feet
FWEC	Foster Wheeler Environmental Corporation
HWMU	Hazardous Waste Management Unit
IDW	Investigation-Derived Waste
LUTP	Post-Closure Land Use Tracking Plan
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
msl	Mean Sea Level
PCP	Post-Closure Plan
PES	Parsons Engineering Science
Shaw	Shaw Environmental, Inc.
SWMU	Solid Waste Management Unit
TDS	Total Dissolved Solids
TERC	Total Environmental Restoration Contract
TSDF	Treatment, Storage, and Disposal Facility
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
UDSHW	Utah Division of Solid and Hazardous Waste
USACE	U.S. Army Corps of Engineers

1.0. INTRODUCTION

The objective of this Post-Closure Plan (PCP) is to ensure that Dugway complies with the Post-Closure Permit issued by the State of Utah in accordance with 40 Code of Federal Regulations (CFR) 265.117, with respect to post-closure inspection requirements. To meet this objective, this PCP provides detailed information regarding the location, regulatory criteria, and post-closure inspections at HWMU 33. Post-closure requirements will continue for a minimum of 30 years after closure of HWMU 33. The post-closure care period may be extended or shortened, as deemed necessary (40 CFR 265.117(a)(2)).

In accordance with 40 CFR 270.28 and UAC R315-3-2.19, the post-closure permit is required to include specific information for a closed facility. As applicable to HWMU 128, the information requirements include:

1. General description of the facility
2. Description of security procedures
3. Copy of general inspection schedule
4. Preparedness and Prevention Plan
5. Facility location information (including seismic and flood plain considerations)
6. Closure Plan or Closure Proposal
7. Certificate of Closure
8. Topographic map, with specific scale

Table 1-1 provides the regulatory citations for the general information requirements and the specific locations in the Attachments or in the Post-Closure Plan where the specific information is presented.

Table 1-1: Summary of HWMU 33 Post-Closure Information Requirements Under 40 CFR 270.14 and UAC R315-3-2.19 and R315-3.2.5 (Page 1 of 2):

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR 270.14(b)(1) UAC R315-3-2.5(b)(1)	General Description of the Facility	Post-Closure Permit, Attachment 1;
40 CFR 270.14(b)(4) UAC R315-3-2.5(b)(4)	Description of Security Procedures	Section 3.0
40 CFR 270.14(b)(5) UAC R315-3-2.5(b)(5)	General Inspection Schedule	Section 7.0
40 CFR 270.14(b)(6) UAC R315-3-2.5(b)(6)	Preparedness and Prevention	Section 3.0
40 CFR 270.14(b)(11)(i-ii, v) UAC R315-3-2.5(b)(11) (i-ii, v)	Facility Location Information Applicable seismic standard	Section 5.0
40 CFR 270.14(b)(11) (iii-v) UAC R315-3-2.5(b)(11) (iii-v)	Facility Location Information 100-year floodplain	Section 6.0
40 CFR 270.14(b)(14) UAC R315-3-2.5(b)(14)	Closure Certification and Notification	Appendix B
40 CFR 270.14(b)(16) UAC R315-3-2.5(b)(16)	Post-Closure Cost Estimate	Federal Facilities are exempt from this requirement
40 CFR 270.14(b)(18) UAC R315-3-2.5(b)(18)	Proof of Financial Coverage	Federal Facilities are exempt from this requirement
40 CFR 270.14(b)(19) UAC R315-3-2.5(b)(19) (i)	Topographic Map Map Scale and Date	Figure 2-1 (1 inch = 1000 feet) and Figure 2-2; (1 inch = 60 feet)
40 CFR 270.14(b)(19) UAC R315-3-2.5(b)(19) (ii)	Topographic Map 100-year floodplain area	HWMU 33 is not located within a verified 100-year floodplain area; Figure 2-2
40 CFR 270.14(b)(19) UAC R315-3-2.5(b)(19) (iii)	Topographic Map Surface waters including intermittent streams	There are no surface waters or intermittent streams within the HWMU 128 area Figure 2-2
40 CFR 270.14(b)(19) UAC R315-3-2.5(b)(19) (iv)	Topographic Map Surrounding land uses	HWMU 33 is within a military base. There are no nearby residents in the vicinity of HWMU 33. Figure 2-2
40 CFR 270.14(b)(19) UAC R315-3-2.5(b)(19) (v)	Topographic Map A wind rose (i.e., prevailing windspeed and direction)	There are no residential populations in the vicinity of HWMU 3. The closest residential area is English Village (approximately 12 miles away). A wind rose is not deemed necessary for HWMU 33.
40 CFR 270.14(b)(19) UAC R315-3-2.5(b)(19) (vi)	Topographic Map Orientation of Map, North Arrow	Figure 2-2

Table 1-1 (Continued-Page 2 of 2): Summary of HWMU 33 Post-Closure Information Requirements Under 40 CFR 270.14 and UAC R315-3-2.19 and R315-3.2.5.

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR 270.14(b)(19) UAC R315-3-5(b)(19)(vii)	Topographic Map Legal boundaries of the hazardous waste management facility.	The site is shown in Figure 2-2
40 CFR 270.14(b)(19) UAC R315-3-2.5(b)(19) (viii)	Topographic Map Access control, fence, gates	The fenced area and access gates are shown in, Figure 4.2
40 CFR 270.14(b)(19) UAC R315-3-2.5(b)(19) (ix)	Topographic Map Injection and withdrawal wells	There are no injection or withdrawal wells in the vicinity of HWMU 33. Monitoring wells are shown in Figure 2-2
40 CFR 270.14(b)(19) UAC R315-3--2.5(b)(19) (xi)	Topographic Map Barriers for drainage or flood control	The HWMU site has been retrofitted with a new expanded bermed sewage lagoon system that is operating under a separate permit, Figure 2-2
40 CFR 270.14(c) UAC R315-3-2.5(c)(1)	Groundwater Monitoring Information Summary of Groundwater Data	Not applicable. No post-closure groundwater monitoring required at HWMU 33.
40 CFR 270.14(c) UAC R315-3-2.5(c)(2)	Groundwater Monitoring Information Identification of uppermost aquifer	Not applicable. No post-closure groundwater monitoring required at HWMU 33.
40 CFR 270.14(c) UAC R315-3-2.5(c)(3)	Groundwater Monitoring Information Delineation of the Waste Management Area	Not applicable. No post-closure groundwater monitoring required at HWMU 33.
40 CFR 270.14(c) UAC R315-3-2.5(c)(4)	Groundwater Monitoring Information Extent of Plume	Not applicable. No post-closure groundwater monitoring required at HWMU 33.
40 CFR 270.14(c) UAC R315-3-2.5(c)(5)	Groundwater Monitoring Information Detailed Plans/Engineering Report for Proposed Groundwater Program	Not applicable. No post-closure groundwater monitoring required at HWMU 33.
40 CFR 270.14(c) UAC R315-3-2.5(c)(6)(i)	Groundwater Monitoring Information Proposed List of Parameters	Not applicable. No post-closure groundwater monitoring required at HWMU 33.
40 CFR 270.14(c) UAC R315-3-2.5(c)(6)(ii)	Groundwater Monitoring Information Proposed Groundwater Monitoring System	Not applicable. No post-closure groundwater monitoring required at HWMU 33.
40 CFR 270.14(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Not applicable. No post-closure groundwater monitoring required at HWMU 33.
40 CFR 270.14(c) UAC R315-3-2.5(c)(6)(iv)	Groundwater Monitoring Information A description of the Proposed Sampling	Not applicable. No post-closure groundwater monitoring required at HWMU 33.

2.0. HWMU 33 DESCRIPTION

The following provides a general description of Hazardous Waste Management Unit (HWMU) 33, also known as the Baker Sewage Lagoon at Dugway Proving Ground (Dugway). HWMU 33 has been closed, retrofitted and incorporated into a new expanded The HWMU 33 lagoon is not active and has been retrofitted and incorporated into a new sewage lagoon system expansion constructed in 2002-2003. The new sewage lagoon expansion system is operating under a separate Utah Division of Water Quality permit, and encompasses the area formerly occupied by HWMU 33 lagoons. A general description of the Dugway installation can be found in Module VII Attachment 1.

2.1. Location and History

HWMU 33, known as the Baker Sewage Lagoon, is located approximately 1,800 feet (ft) north of Burns Road and 900 ft east of Cherait Road in the Baker Area (Figure 2-1).

The following describes the HWMU 33 lagoon system before the lagoon was retrofitted and incorporated into the new lagoon expansion system. The HWMU included the sewage lagoon with a concrete spillway and an outfall area. The HWMU 33 former site features are shown on Figure 2-2. Most of the information presented in this section was taken from the HWMU 33 Final Closure Plan (Foster Wheeler Environmental Corporation [FWEC], 1998). The reader is referred to this document for more detailed site background information. The bermed lagoon was an engineered structure located on gently sloping ground at the north end of the Baker Area. The top of the berm was approximately 4,308 ft mean sea level (msl), while the surrounding terrain is approximately 4,300 ft msl. Comparison of an aerial photograph taken in August 1953 with one taken in June 1981 indicates that the location of the outfall area of the sewage lagoon corresponds to the location of the outfall at the former Baker Sewage Drainfield (Corrective Action Solid Waste Management Unit [SWMU] 35), which was in operation from about 1952 to 1975. The Baker Sewage Lagoon came on line in 1975.

The flat lagoon bottom was 210 ft long and 130 ft wide, with an overall depth of 8 ft. The finished surface area of the lagoon was about 0.93 acres, with a total capacity of about 1.4 million gallons. The lagoon bottom was lined with a 1-foot thick layer of native clay and was enclosed by a 3:1 sloped berm about 6 ft high. The concrete spillway on the northern edge of the lagoon is about 15 ft wide and its lip is 0.5 foot below the top of the berm that surrounds the lagoon. The concrete outfall was installed in 1989, along with several other modifications, including raising the berm height and adding 0.5 foot of gravel on top of the clay/bentonite seal. The 0.5-foot layer of gravel overlaid the 1-foot thick clay layer along the entire length of the sloped berms. Other modifications included the addition of an inlet splash pad in the center of the lagoon and the replacement of the existing 8-inch diameter polyvinyl chloride (PVC) sewer line with a 4-inch diameter PVC force-main line. These modifications served to aerate the wastewater as it entered the lagoon. HWMU 33 was used from 1975 until 1996 for disposal of sanitary and laboratory wastes from various facilities in the Baker Area. These facilities previously included a biological laboratory,

change house, decontamination buildings, the munitions cold storage and loading buildings, a storage building, and the boiler house.

2.2. Past Operation

The original design flow capacity of the Baker sewage lagoon was 21,500 gallons of effluent per day. The average flow into the lagoon in 1976 was 14,200 gallons per day. The design flow capacity of the former outfall area, which had an areal extent of two acres and was natural grade and vegetated, is reported to have been 48,000 gallons of effluent per day. The flow into this drainfield averaged 13,250 gallons per day in 1974.

HWMU 33 was used from 1975 until 1996 for disposal of sanitary and laboratory wastes from various facilities in the Baker Area. These facilities previously included a biological laboratory, change house, decontamination buildings, the munitions cold storage and loading buildings, a storage building, and the boiler house. The sewage from these facilities was previously routed through a treatment plant located in Building 2000 and then to the HWMU 33 lagoon through an underground pipeline (see Figure 2-2). More recently, wastewater was discharged directly to the lagoon from the source facilities. Solids were allowed to settle out in the lagoon and the liquids were allowed to percolate into the soil or to evaporate. Prior to the construction of the lagoon, liquid wastes were discharged directly to the original drainfield, a shallow depression, via an aboveground sewer pipe. From this drainfield, liquid wastes were discharged into the open desert north of the lagoon.

HWMU 33 was one of the 27 sites listed at Dugway under the UDEQ-DSHW Stipulation and Consent Order No. 8909884 (dated September 19, 1990). This Consent Order directed Dugway to determine whether hazardous waste management occurred at these sites. This Stipulation and Consent Order was amended in December 22, 1993 and identified HWMU 33 among the sites to be closed.

2.3. Previous Investigations Documentation

The detailed results of previous material, soil, and groundwater sampling, and closure information including the risk assessment are available, for HWMU 33 in the UDSHW public documents listed below in Table 2-2.

Table 2-2: Pertinent UDSHW Library Documents Detailing HWMU 33 Investigations.

Document Title	Received Date	UDSHW Library No.
Final Dugway Proving Ground Closure Plan Module 3 HWMU 33 (Baker Sewage Lagoons)	6/24/1998	DPG 00106
Draft Final Remedial Action Plan HWMU 33 Baker Area Storage Lagoon, Dugway Proving Ground	10/25/1999	DPG 00153
Final Interim Remedial Action Plan (Revision 0) Hazardous Waste Management Unit (HWMU 33.	7/13/2000	DPG 00189
Hazardous Waste Management Unit (HWMU) 33 Risk Based Screening Evaluation for Closure.	1/18/2001	DPG 00203
Remedial Action Closure Report Hazardous Waste Management Unit (HWMU) 33 Former Baker Area Sewage Lagoon. Also the Final Quality Control Summary Report.	8/24/2001	DPG 00234
Final Remedial Action Closure Report, Revised, Hazardous Waste Management Unit (HWMU) 33 Former Baker Area Sewage Lagoon	6/5/2003	DPG 00343

2.4. Closure Activities

The detailed results of previous material, soil, and groundwater sampling at HWMU 33 are included in the Final Closure Report. The reader is referred to these documents for detailed information.

Utah has specific regulations governing the closure and post-closure requirements for interim status/non-notifier hazardous waste treatment, storage and disposal facilities (TSDFs) (UAC R315-7-14; 40 CFR 265.111 by reference). Based on the work performed at HWMU 33 and the risk evaluations presented in the Final Closure Report, the requirements specified under 40 CFR 265, subpart G and a Consent Order have been achieved.

The Certification of Closure (Appendix B) certifies that HWMU 33 meets the closure performance standards under UAC315-7-14 and 40 CFR 265.111 (subpart G) adopted by reference, as follows: (1) minimizes the need for further maintenance, (2) controls, minimizes or eliminates, to extent necessary to protect human health and environment, post closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere, and (3) complies with closure requirements of this subpart and other applicable requirements.

The remedial activities performed at HWMU 33 are described in detail in the Final Remedial Action Closure Report (Appendix B). As part of the remedial activities, the following hazardous wastes were removed and disposed in accordance with the state and federal regulations: (1) 583 tons of lagoon sludge; (2) 2,345 gallons of decontamination liquids; (3) 250 gallons of pipe contents (liquids); (4) 16 tons of pipeline materials and pipe contents; and (5) other miscellaneous hazardous wastes. Non-hazardous wastes disposed consisted of excavated soils, pipe contents (liquids), and miscellaneous wastes and debris. The following structures were partially or completely removed at HWMU 33 as part of closure activities: lagoon liner and influent pipeline systems. After the removal of the wastes and structures, soil confirmation sampling was conducted and the results were included in the human and ecological risk assessments for HWMU 33. The human and ecological risk assessments are also presented in the Final Remedial Action Closure Report.

The closure of HWMU 33 has been completed. Approval for the HWMU 33 Final Remedial Action Closure Report (IT, 2003) was received in a letter dated July 8, 2003, from Mr. Dennis R. Downs, Utah Solid and Hazardous Waste Control Board. Appendix B includes a copy of the HWMU 33 Closure Certification signed and stamped by a Utah-licensed Professional Engineer. With the investigative, remedial, and closure actions performed at this site, all stipulations of the Consent Order has been satisfied for HWMU 33.

2.5. Human Health and Ecological Risk Assessment

A human health risk assessment and ecological risk assessment have been conducted indicating the remaining residual contamination does not pose an unacceptable risk as defined in UAC 315-101. The cancer risk is less than 1E-04 and the Hazard Index is less than 1. Since the waste has been removed, there is no potential for escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, surface waters, or to the atmosphere.

HWMU 33 did not qualify for risk-based residential closure due to the presence of inorganics (arsenic, chromium, and mercury) in site soils primarily present within the northern outfall drainage area.

HWMU 33 has been closed in a manner that will no longer require any post-closure maintenance, including the removal of wastes and appurtenances (influent pipelines, partial clay liner, and influent splash pad). In accordance with the approved IRAP (IT, 2000a, see Attachment 2G for list of references), only partial removal of the clay liner was required. Hazardous operations are no longer taking place at HWMU 33. The site has been retrofitted as a non-hazardous sewage lagoon and is operating under a separate permit. The site will therefore remain industrial.

The human and ecological risk assessments are presented in the *Final Remedial Action Closure Report, Revised, Hazardous Waste Management Unit (HWMU) 33 Former Baker Area Sewage Lagoon, 2003.*

2.6. Surface Water and Groundwater

Based on the topography of the area, the natural drainage of surface water is to the north-northwest. HWMU 33 appears to be in the central portion of a natural drainage visible on aerial photographs. No distinct natural drainage features are evident on the ground.

Previous contractors for Dugway installed four groundwater monitoring wells at HWMU 33. Based on regional groundwater flow, MW01 was installed upgradient of the sewage lagoon, and wells MW02, MW03, and MW04 were installed downgradient to the north and west of the lagoon. These wells were screened between about 5 and 25 ft below ground surface (bgs) within a sandy interval that underlies the surficial clay layer. The well screens are 15 ft long. Monitoring well MW-01 was abandoned in September 2000 due to the construction of a new sewage lagoon treatment unit in the vicinity. Groundwater at HWMU 33 varies between 3-5 ft bgs depending on the location and surface elevation.

The conceptual model for the HWMU 33 area includes predominantly lateral flow in a shallow saline aquifer. Groundwater direction at HWMU 33 is to the northwest. The upper aquifer is non-potable as total dissolved solids (TDS) concentrations in the upper portion of this aquifer, as measured in background well MW01, are about 47,000 milligrams per liter (mg/L). According to Utah Administrative Code (UAC) R317-6-2, this TDS concentration corresponds to Class IV groundwater (saline) (>10,000 mg/L TDS).

In the vicinity of HWMU 33 the subsurface has been characterized to include an upper water-bearing zone (approximately 4 to 30 ft bgs) based on the boring logs for the monitoring wells installed at the HWMU and extrapolation of Parsons Engineering Science (PES) data collected west of the Ditto Area. The base of the upper water-bearing zone consists of a sand zone (Unit A), which corresponds to Unit A in the PES Technical Memorandum for Groundwater Assessment (PES, 2000). The upper portion of the upper water-bearing zone is made up of silty clay.

Below Unit A, subsurface deposits consist primarily of sand with some layers of clay 30 to at least 173 ft bgs and referred to as the Shallow Aquifer corresponding to Units B, C, and D in the PES Technical Memorandum (PES, 2000). The base of the Shallow Aquifer

deepens from 103 ft to 192 ft between Ditto and Baker. An aquitard consisting of silt and clay exists below the Shallow Aquifer in the Ditto Area and appears to continue into Baker beginning at a depth of 192 ft. Logs of Water Supply Wells 15, 16, and 17 located in the Baker Area indicate a thick sequence of clay with a top surface ranging from 192 to 201 ft bgs and base ranging from 243 to 257 ft bgs. The thickness of this clay unit in Baker is consistent with the aquitard found further east at Ditto.

No chemical data is available from Water Supply Well 15, but a zone of brackish water from 75 to 115 ft (the lower portion of the shallow aquifer) is noted on the well log. Water Supply Wells 16 and 17 are screened in the deeper aquifers at 260 to 273 ft bgs and 290.5 to 302.5 ft bgs, respectively. Well No. 15 was a test well which is now abandoned. Wells 16 and 17 are inactive. On the well log for Water Supply Well 15, a sand zone at 243 to 245 ft bgs is noted as fresh. However, slightly deeper zones within the screen intervals of Water Supply Wells 16 and 17 are reported to be non-potable with TDS concentrations between 1,000 and 3,000 mg/L. Although neither aquifer is potable, the notable drop in TDS concentrations between the shallow water bearing zone (4 to 30 ft bgs) and aquifers at 260 to 303 ft bgs suggests that there may be little communication between the two zones. When they were in use, groundwater was present under artesian conditions in Water Supply Wells 16 and 17, with water levels rising to near the ground surface and in some cases above. Comparison of the hydraulic head of these water production wells to the water table in the shallow monitoring wells suggests that there may be an upward vertical gradient from the lower aquifer to the upper aquifer system.

2.7. Closure Notifications

Federal facilities are exempt from submitting notifications to the local zoning authority as required by 40 CFR 264.116 and 264.119, which are incorporated by reference in R315-8-7. Dugway's Post-Closure Land Use Tracking Plan (LUTP) shall be used to monitor land use as required under this Permit in Module VII, Condition F.4.

3.0. SECURITY REQUIREMENTS

The Permittee shall comply with the following security conditions as applicable to HWMU 33:

1. HWMU 33 is located within a federal, military installation (Dugway Proving Ground). As such, the installation is restricted for the common population. Access to HWMU 33 is monitored by Dugway Base Security (Range Control)

2. Specifically at HWMU 33, a fence is present with a locked gate that surrounds the retrofitted lagoon on all sides, with the exception of the former drainfield area, which prevents unauthorized entry. The former lagoons and the outfall areas are subject to post-closure inspections. The fence shall be maintained throughout the post-closure care period.

3. A sign, which reads "DANGER, UNAUTHORIZED PERSONNEL KEEP OUT", is posted at the entrance gate leading to the former HWMU 33 lagoon and shall be maintained throughout the post-closure care period. A warning sign shall be posted on the former drainfield area. The signs shall be legible from a distance of at least 25 feet.

4. All security facilities shall be inspected throughout the post-closure care period. The Permittee shall incorporate those security facilities (i.e., fence and posted signs) to be inspected and the frequency of inspection on the inspection schedule as required under Table 3.

5. Damaged security facilities shall be noted in the inspection checklist. Repairs shall be completed as soon as practicable after the problem is discovered, in compliance with R3l5-8-2.6(c).

6. Verify security facilities are maintained and shall be inspected throughout the post-closure care period. The security facilities (i.e., posted signs) to be inspected and the frequency of inspection are listed on the inspection Table 3**.** Dugway shall report to the Division of Solid and Hazardous Waste any decrease of Dugway's Base Security, which could affect the security conditions as applicable to HWMU 33.

7. Damaged security facilities shall be noted in the inspection checklist. Repairs shall be completed as soon as practicable after the problem is discovered, in compliance with R3l5-8-2.6(c).

4.0. PREPAREDNESS AND PREVENTION MEASURES

All wastes have been removed from HWMU 33. The Dugway Emergency Response and Contingency Plan (Part B Permit), where applicable to this site, shall be used to announce and respond to emergency conditions.

At a minimum, the site inspector should have a radio or phone and a First Aid kit available during inspections.

5.0. SEISMIC STANDARD

HWMU 33 is not located within 200 feet of active faults, which have displacement in Holocene time. Although Utah is tectonically active, most of the earthquake activity occurs about 55 miles to the east along the Wasatch Range Foothills. The U.S. Geological Survey has conducted a study ([U.S. Geological Survey (USGS), 1988]. Map of Fault Scarps Formed on Unconsolidated Sediments, Tooele 1°x2° Quadrangle, Northwestern Utah. Compiled by T.P. Bamhard and R. L. Dodge) to determine the distribution, relative

age, and amount and extent of surface rupture on Quaternary fault scarps in the Tooele 1°x2° Quadrangle in northwestern Utah. The conclusions of the study state that morphologic and geologic data collected along the fault scarps in the area indicate that all were formed during the later Pleistocene era with no clear evidence of Holocene surface faulting. Several faults inferred on geophysical evidence are located at Dugway; however, there is no evidence of displacement during Holocene time. With the removal actions at HWMU 33, no hazardous wastes remain at the site; therefore, even if an earthquake were to occur, no hazardous wastes would be released.

6.0. FLOODPLAIN STANDARD

HWMU 33 is not located within a 100-year verified floodplain. A National Flood Insurance Rate Map, identifying the boundary of the 100-year flood, has not been prepared for Dugway. These are no permanent streams or other surface water bodies on Dugway. Surface water from precipitation flows through well-established drainage channels into the flat plain and evaporates. Like other arid regions, Dugway is subject to flash flooding following high-precipitation events. Flash floods have occurred only four times in the history of the installation, in 1944, 1952, 1973, and 1983. The major area affected during flash floods has been the Government Creek drainage channel, which has overflowed and caused minor inundation of roads at Ditto Technical Center. With the removal actions at HWMU 33, no hazardous wastes remain at the site; therefore, even if a flood were to occur, no hazardous wastes would be released.

7.0. POST-CLOSURE INSPECTIONS

7.1. Introduction

HWMU 33 has been closed under a continued industrial use scenario, which prohibits residential use in the areas formerly occupied by the site. To ensure that the area is not reused or developed for residential purposes, annual site inspections and a biannual report shall be required.

7.2. Annual Inspections

General site inspections of the former HWMU 33 site shall be conducted annually before November 1st, to ensure that the former Baker Sewage Lagoon area remains under industrial use. The frequency of inspections can be modified in accordance with UAC R315-3-4.3. A general annual site inspection checklist is included in Appendix A. Completed inspection forms shall be filed with the Dugway Environmental Office. The site shall be visually inspected to ensure the following conditions are maintained at the site:

1. There is no evidence of land use other than for industrial purposes within the former site boundary.

2. That Security Controls (eg. Signs) are still in place and active at HWMU 33.

Table 7-1, summarizes the Post-Closure Inspection Schedule for HWMU 33, and lists the items to be inspected and potential problems. Inspection personnel shall note any problems found and shall inform appropriate Dugway representatives.

Table 7-1: HWMU 33 Post-Closure Inspection and Monitoring Schedule.

Inspection/Monitoring Item	Method of Documentation	Frequency of Inspection
1) Land use for industrial purposes only. 2) That signs security controls are still in place and active.	General Site Inspection Checklist: Appendix A of the Post-Closure Plan)	Annual inspections shall be conducted before November 1st, of each year.

7.3. Inspection Follow-up

Copies of completed site inspection checklists (Appendix A) shall be forwarded to the Dugway Environmental Office. The Point-of-Contact for the Dugway Environmental Office is as follows:

Mr. Scott Reed
Dugway Proving Ground Environmental Program Office
Dugway Proving Ground, UT 84022
Telephone: (435) 831-3592

The Dugway Environmental Office shall notify the appropriate personnel to implement corrective action as needed. Corrective action shall be initiated as soon as practical after identifying the problem, or as directed by Dugway. If the corrective action requires substantial effort, a technical plan shall be prepared to summarize the problem, the potential impacts, the proposed plan for action, and the time frame in which corrective action shall be implemented as required under this Permit. This plan shall be approved by the Executive Secretary and shall be submitted within 30 days of Dugway's decision to implement corrective action.

8.0. SUBMITTALS/REPORTING

8.1. Post-Closure Groundwater Monitoring

Based on the evaluation presented in Revised Final Remedial Action Closure Report, no post closure groundwater monitoring is required for HWMU 33.

8.2. Biennial Post-Closure Report

In accordance with R315-3-3.1(l)((9), a Biennial Post-Closure Report shall be prepared for all of Dugway's HWMUs and SWMUs undergoing post-closure care. Post Closure Reports shall be submitted to DSHW no later then March 1st, of the following year, that the report is due. The first Post-Closure reporting year is 2006 for HWMU 33. The report shall be submitted no later than March 1st of 2007 (Table 7-2). The first Post-Closure report for Specifically for HWMU 33, the Biennial Post-Closure Report shall include, at a minimum, the following:

1. General site description and conditions
2. Inspection records

Table 7-2: Summary Table of Required Submittals.

Required Submittals	Frequency and Submittal Date
Biennial Post-Closure Report	Post Closure Reports shall be submitted to the Division of Solid and Hazardous Waste no later than March 1st, of the following year, that the report is due. Reporting years are even numbered years beginning with 2006, for the duration of the Post-Closure Monitoring Period.
Anticipated Non-Compliance (VII.C.5.).	30 days advance notice of any change, which may result in non-compliance.
24-hour Notification on information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment (VII.C.5.).	Orally within 24 hours of discovery noncompliance
Five-day written notification on information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment. The Executive Secretary may waive the 5-day notice, in favor of a 15-day notice (VII.C.5.).	Within 5 days of discovery
Written notification on information concerning the non-compliance, which does not endanger human health or the environment (VII.C.5.).	Submitted with the Biannual Post Closure Report are submitted.

9.0. Post-Closure Certification

No later than 60 days after post-closure activities are completed and approved by the Executive Secretary, Dugway shall submit a certification to the Board, signed by Dugway and an independent professional engineer registered in the State of Utah, stating why post-closure care is no longer needed.

REFERENCES

Foster Wheeler Environmental Corporation (FWEC), 1998. *Dugway Proving Ground Closure Plan, Module 3, HWMU 33, Final.* May.

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DUGWAY PERMIT

MODULE VII

ATTACHMENT 4

APPENDIX A

HWMU 33
INSPECTION CHECKLIST

GENERAL SITE INSPECTION CHECKLIST
HWMU 33 Baker Sewage Lagoon
Dugway Proving Ground, Utah
Post-Closure Plan

1. Are posted signs in place and in good condition (legible from a distance of 25 feet)?

☐ Yes

☐ No *

* If no, mark location(s) of damaged or missing signs and notify the Dugway Environmental Office immediately (same business day) for repairs or replacements.

Comments: _____

2. Is the former lagoon adequately secured by a perimeter fence in good condition? Is the lock still in-place and undamaged?

☐ Yes

☐ No *

* If no, secure (with locks obtained from the Dugway Environmental Office) perimeter fence. If the fence is damaged, mark location of damage and notify the Dugway Environmental Office immediately (same business day) for repairs.

Comments: _____

3. Inspect the access road leading to the new lagoon system site. Are there significant potholes and/or erosion?

☐ Yes *

☐ No

If yes, notify the Dugway Environmental Office immediately (same business day) to determine the appropriate course of action for repair.

Comments: _____

4. Inspect the three monitoring wells. Is there any damage to the above-ground casing, cement apron, annulus, locks, and well caps?

☐ Yes *

☐ No

If yes, notify the Dugway Environmental Office immediately (same business day) to determine the appropriate course of action for repair.

Comments: _____

5. Inspect the outfall area associated with the former lagoon. Is there evidence of land use other than industrial use?

☐ Yes *

☐ No

** If yes, notify the Dugway Environmental Office immediately (same business day) to determine the appropriate course of action..*

Comments: _____

Additional Notes ***(Time, temperature, wind direction, and other observations)***

_____

_____

_____

_____

_____

_____

_____

_____

_____
Name of Inspector

_____
Company

_____ _____
Signature of Inspector Time and Date of Inspection

DUGWAY PERMIT

MODULE VII

ATTACHMENT 4

APPENDIX B

HWMU 33

CERTIFICATION OF CLOSURE

CERTIFICATION OF CLOSURE

The Closure Report for Hazardous Waste Management Unit (HWMU) 33 at Dugway Proving Ground, Utah has been prepared by Shaw Environmental in accordance with the closure requirements specified under the Utah Administrative Code (UAC) 315-7-14 and 40 Code of Federal Regulations 265, Subparts G and K for closure of HWMU 33. The requirements of UAC 315-101 form the basis for the risk-based criteria in the closure of HWMU 33.

In accordance with 40 CFR 265.115, the signature and seal certify that a licensed professional has reviewed the Closure Report in accordance with the above referenced regulatory requirements.

Respectfully submitted,

Scott Reed
Directorate of Environmental Programs
Dugway Proving Ground

Adam S. Ng, Ph.D., P.E.
Shaw Environmental, Inc.
Utah Registered Civil Engineer No. 4858945-2202

EXP

12/31/04

DUGWAY PERMIT

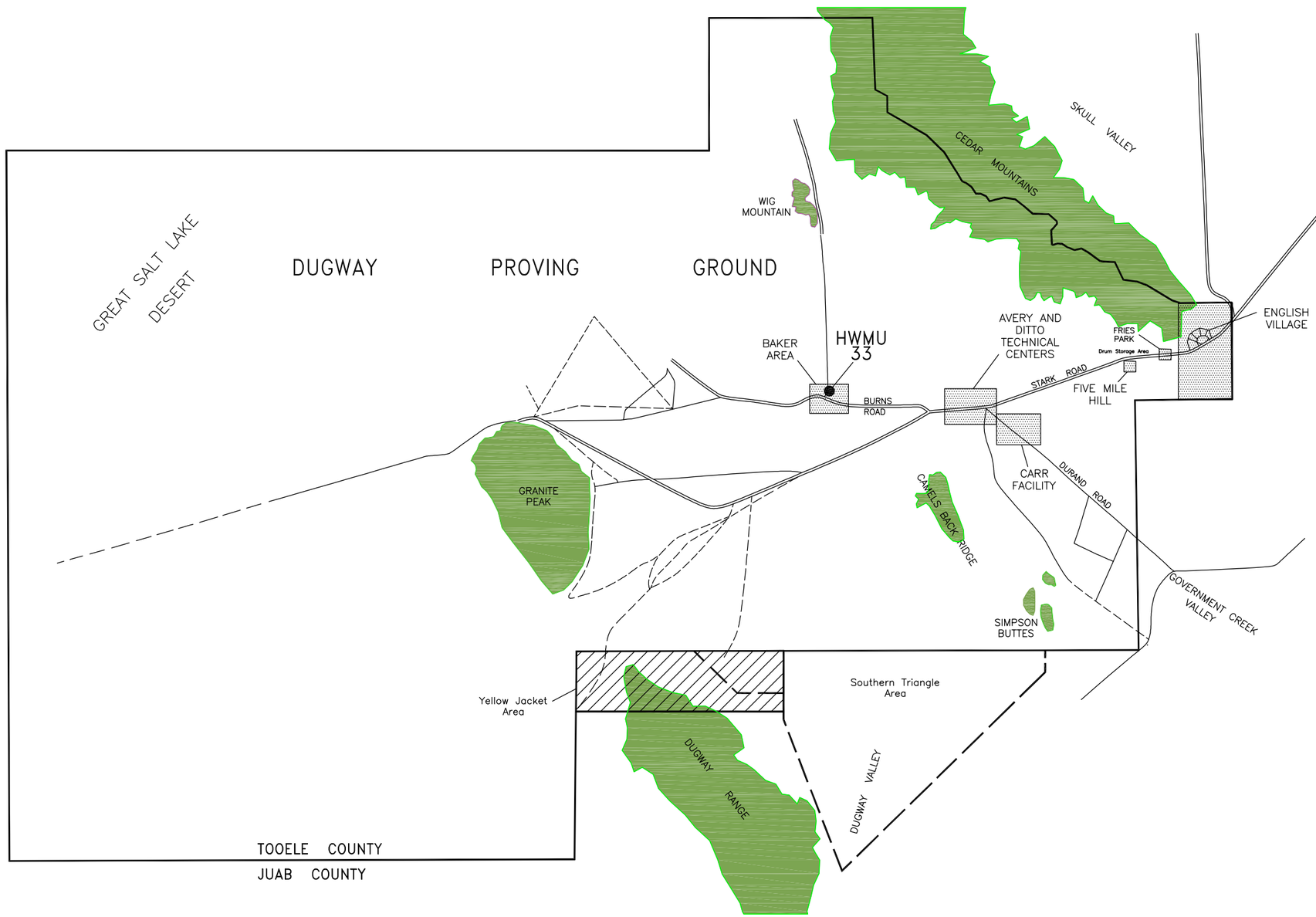
MODULE VII

ATTACHMENT 4

HWMU 33

FIGURES

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	CONC	R. LANGSTON 8/21/2003	A. Ng 8/21/2003		870502-B501



LEGEND

- Trail or unpaved road
- Secondary road
- Primary road
- Installation boundary

N

SCALE IN MILES

4 0 4

IT CORPORATION

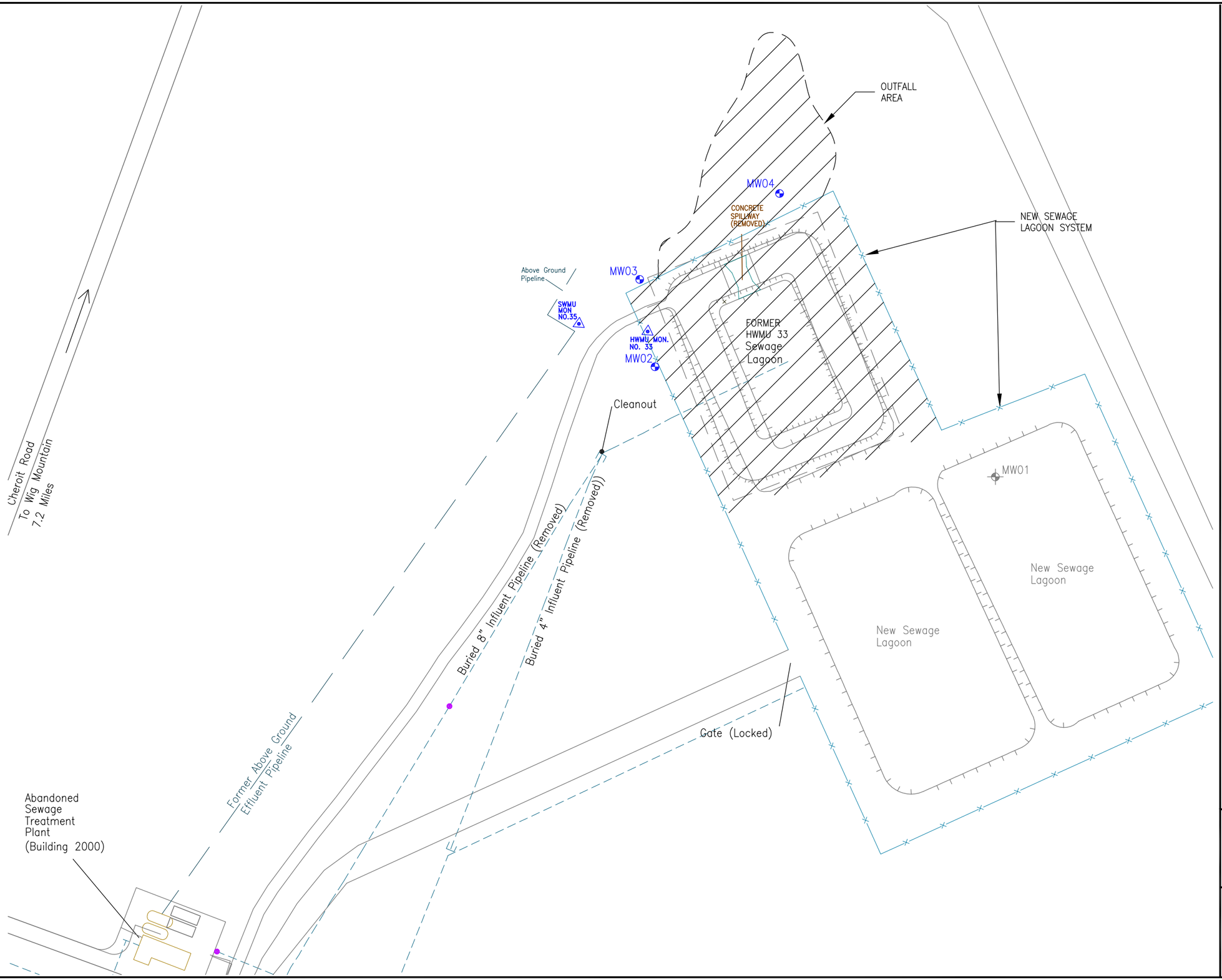
U.S. ARMY
CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FIGURE 2-1

DUGWAY PROVING GROUND
AND HWMU 33
LOCATION MAP

DUGWAY PROVING GROUND
DUGWAY, UTAH

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	CONC	R. LANGSTON 8/21/2003	A. Ng 8/21/2003	CRC 8/21/2003	870502-B500



LEGEND

- MW02 Monitoring Well
- MW01 Monitoring Well (Abandoned Sept. 2000)
- SWMU/HWMU Monument
- Manhole
- Fence
- Road
- Extent of Outfall Area
- Former HWMU 33 Site Boundary

N

SCALE IN FEET

120 0 120

APPROXIMATE SCALE

Modified From
Foster-Wheeler, 1998

IT CORPORATION

U.S. Army
Corps of Engineers
Sacramento District

FIGURE 2-2

HWMU 33
SITE FEATURES

DUGWAY PROVING GROUND
DUGWAY, UTAH